Doc# NSCS-M-P-7093-02-13
Title: Oil Recovery System - Interim
Issue Dt: 05/07/1997
Revision Dt: 07/23/2018 Review Interval: 12
Cat: Quality Doc Type: SOP
Auth:
Desc: Oil Recovery System - Interim
Loc: Midwest - Utilities-Midwest - Plant Maintenance-Midwest-Gary Works

1. Purpose

1.1. General Operation and Equipment

1.1.1. This procedure describes the general operation and process equipment of the Oil Pretreatment Plant. The plant is designed to remove oil and grease prior to additional treatment at the Final Treatment Plant.

2. Equipment Operation

2.1. Equalization Tank

2.1.1. The [redacted] gallon equalization tank receives pumped wastewater from the following plant operations: 50" and 80" Five Stands, DCR Mill, Tin Mill Temper Mill, Transportation Garage, and the Oily Waste Pad. The tank allows for equalization and mixing of the various oily sources.

2.1.2. The oily wastewater contains animal fat, vegetable oils and mineral oils. The oils are both petroleum based and emulsified.

2.2. North API Interceptor

2.2.1. Mix Tank

2.2.1.1. Oily wastewater gravity flows from the Equalization Tank into the Mix Tank. This area of the interceptors has ability to split between the two North API Interceptors, East and West. Flow can be directed to one, or both, of the interceptors.

2.2.2. Emulsion Breaker [redacted] Dosing System

2.2.2.1. The [redacted] is stored in a tank within containment in the North API Interceptor building. Check the level of the tank 2 times per turn and record on Log Form [redacted]

2.2.2.2. Control switch positioning: Determine which pump will be operating then turn the Selector Switch to the Pump A or Pump B position. Check the feed rate 4 times per shift and record on Log Form [redacted]

2.2.3. Polymer [redacted] Dosing System

2.2.3.1. The polymer [redacted] is stored in a tank within containment in the North API Interceptor building. Check the level of the tank 2 times per turn and record on Log Form [redacted] The polymer may be dosed if needed.

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2.2.3.2. Control switch positioning: Determine which pump will be operating then turn the Selector Switch to the Pump A, Pump B or Pump C position. Check the feed rate 4 times per shift and record on Log Form [redacted]

2.2.4. North API Interceptor

2.2.4.1. During the retention time in the interceptor units, oils, fats and greases (generally referred to as oils) are separated from the wastewater. [redacted] is dosed into the system to better aid this process.

2.2.4.2. The interceptor color and pH should be noted on the Inspection Form [redacted] four times per turn.

2.2.4.2.1. If the color is white, it is an indication that hydraulic oil is present. If the white color is noted, increase the feed rate of the [redacted] Notify the production units and ask them to inspect for a hydraulic leak in the basements.

2.2.4.2.2. If the pH is outside of the normal range recorded on the Inspection Form, contact the production lines to see if a spill, leak, or other source is contributing to the pH swing. Also notify the Final Treatment Plant operator as the high or low pH may affect the equalization basin and other downstream processes at the Final Treatment Plant.

2.2.4.3. The oils that float to the surface of the interceptor are mechanically moved using a water hose. Inspect the skim pool size 4 times per turn. If the pool size covers [redacted] or more of the interceptor surface area, rotate the skimmer handle and use the water hose to direct the oil over the lowered skimmer height and into the Skimmer Sump. Try to position the skimmer height to minimize water carry-over to the extent possible. When complete, rotate the skimmer height back above the wastewater surface. The oils that flow into the Skimmer Sump are pumped by the Skimmer Pumps to the Oil Holding Tanks.

2.2.4.3.1. Record the skim pool size (sq. ft.) on Log Form [redacted] four times per turn.

2.2.4.4. Plant air is injected at the south entry-end of the North API Separators. The air assists in mixing the wastewater to further promote the oils to separate, and prevents the wastewater from becoming septic. Steam is also injected to maintain heat in the interceptors to prevent the oils from solidifying.

2.2.4.4.1. While assessing the skim pool size, check that air is being injected via bubbles at the surface.

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2.2.4.5. The oil-reduced wastewater cascades into the discharge sump of the interceptors. The wastewater is then routed to either the Final Treatment equalization basins or the South Interceptor Mix Tank.

2.3. Operation of the South Monroe Interceptor

2.3.1. Mix Tank TK-7001

2.3.1.1. If the North Interceptor discharge is pumped to the South Interceptor system, the oily wastewater will enter the Mix Tank.

2.3.2. [redacted] Interceptor

2.3.2.1. The interceptor has skimmers on chains at the surface of the wastewater to direct the accumulated oil to the cross screw conveyor. The skimmed oil then enters a sump and is pumped to the North and South Holding Tanks. Steam is circulated through the equipment to add heat and prevent the oils from solidifying.

2.4. Operation of the Dissolved Air Flotation Units [redacted]

2.4.1. DAFs

2.4.2. Two DAF units, East and West, are installed as parallel trains. Typically one train will be operating at a given time, but both trains may be operated as needed. The discharge flow from the [redacted] Interceptor is directed to one of the DAF units via valve positioning.

2.4.3. The entrance end of the DAF unit has mixing zones followed by the oil skimmer section. Fine air bubbles are introduced at the bottom of the DAF unit and aid the remaining oils in being forced to the surface of the unit. The oil skimmer cascades the top oil layer into a sump and is pumped on to the Equalization Tank.

2.4.4. Polymer [redacted] Dosing System

2.4.4.1. The polymer [redacted] stored in a tank within containment in the North API Interceptor building. Polymer may be added to the DAF units if needed.

2.4.4.2. Control switch positioning: Determine which pump will be operating then turn the Selector Switch to the Pump A, Pump B or Pump C position. Check the feed rate 4 times per shift and record on Log Form [redacted]

2.5. Oil Handling

2.5.1. North and South Oil Holding Tanks

2.5.1.1. The North and South Oil Holding Tanks each have a capacity of [redacted] gallons. The oily process wastewater removed from the North API Interceptors and South Monroe Interceptor are pumped to these tanks.

2.5.1.2. The oil is temporarily held in the tanks and pumped via the Transfer Pumps to the Centrifuge.

2.5.1.2.1. Once per turn, record the tank level of both the North and South Holding Tanks on Log Form [redacted]

2.5.2. Centrifuge [redacted]

2.5.2.1. The centrifuge processes the concentrated oily wastewater from the holding tanks. The recovered oil is discharged to the API Sludge Tank. The oil is loaded onto trucks and shipped offsite.

2.5.2.2. The separated wastewater is directed a sump and recycled back to the Equalization Tank for further processing.

2.5.2.3. Inspections of the centrifuge are to be performed by the contractor at a frequency determined by the contractor.

3. Shutdown to Troubleshoot

3.1.1.1. There may be times when you need to stop the transfer of wastewater from the North API Interceptor and/or stop the [redacted] Interceptor or DAFs to adjust something and/or to gain control of the system.

3.1.1.2. Following are steps to be taken:

3.1.1.2.1. There are two methods to shutdown the North Interceptor Effluent Pumps [redacted] temporarily:

3.1.1.2.1.1. Using the Interceptor screen, put the North Interceptor Effluent Pumps in STOP. This is the preferred method because it allows the pumps/system to be restarted from the Computer.

3.1.1.2.1.2. If necessary, the North Interceptor Effluent Pumps can be controlled from the panel adjacent to the pumps. Turn the HOA switches to Hand.